

What Is Claimed Is:

1. A vapor fuel generation and management system for an evaporative fuel vapor engine, comprising:
 - a fuel tank that defines a chamber storing an evaporative liquid fuel, the fuel tank having a liquid fuel outlet and a fuel vapor outlet;
 - a carbon canister in communication with the fuel vapor outlet of the fuel tank;
 - a fuel vaporization unit that generates vapor fuel, the fuel vaporization unit including a movable agitator member, the fuel vaporization unit having a liquid fuel inlet in communication with the liquid fuel outlet of the fuel tank, a fuel vapor inlet in communication with the carbon canister, and a vapor fuel outlet in communication with an engine intake manifold;
 - a purge valve that controls vapor fuel flow to the engine intake manifold.
2. The vapor fuel generation and management system of claim 1, wherein the fuel vaporization unit includes:
 - a housing having a wall defining a chamber, the housing chamber having a lower portion and an upper portion, the lower portion formed for a liquid fuel bath, the upper portion formed for a vapor fuel space.
3. The vapor fuel generation and management system of claim 2, wherein
 - the liquid fuel inlet of the fuel vaporization unit includes a first port in the housing wall;
 - the fuel vapor inlet of the fuel vaporization unit includes a second port in the housing wall proximate the upper portion; and
 - the vapor fuel outlet of the fuel vaporization unit includes a third port in the housing wall proximate the upper portion.
4. The vapor fuel generation and management system of claim 3, wherein the fuel vaporization unit includes a liquid fuel outlet in communication with a liquid fuel inlet of the fuel tank.

5. The vapor fuel generation and management system of claim 4, wherein the liquid fuel outlet of the fuel vaporization unit includes a fourth port in the housing wall proximate the lower portion.

6. The vapor fuel generation and management system of claim 5, wherein the fuel vaporization unit includes a liquid fuel level sensor in the lower portion.

7. The vapor fuel generation and management system of claim 1, wherein the evaporative liquid fuel is gasoline.

8. A fuel vaporization unit of a vapor fuel generation and management system for an evaporative fuel vapor engine, comprising:

- a housing having a wall defining a chamber, the housing chamber having a lower portion and an upper portion, the lower portion formed for a liquid fuel bath, the upper portion formed for a vapor fuel space;

- a liquid fuel inlet port in the housing wall;

- a fuel vapor inlet port in the housing wall proximate the upper portion;

- a vapor fuel outlet port in the housing wall proximate the upper portion;

- an agitator member at least partially disposed in the lower portion; and

- a motive force device that drives the agitator member.

9. The fuel vaporization unit of claim 8, wherein the motive force device is magnetically coupled to the agitator member for rotational driving of the agitator member.

10. The fuel vaporization unit of claim 9, wherein the agitator member comprises an annulus disposed along a central longitudinal axis, the annulus having an inner surface and an outer surface, and a wall formed between the inner and outer surfaces.

11. The fuel vaporization unit of claim 10, wherein the annulus wall includes a first portion and a second portion, the first portion being substantially continuous along the inner and outer surfaces.

12. The fuel vaporization unit of claim 11, wherein the second portion includes a plurality of fin members, each of the fin members having a longitudinal axis.

13. The fuel vaporization unit of claim 12, wherein at least one of the plurality of fin members is cantilevered from the first portion of the annulus wall.

14. The fuel vaporization unit of claim 13, wherein the longitudinal axis of the at least one of the plurality of fin members is disposed in the direction of the longitudinal axis of the annulus.

15. The fuel vaporization unit of claim 12, wherein
each of the plurality of fin members is cantilevered from the first portion of the annulus wall, and
the longitudinal axis of each of the plurality of fin members is disposed in the direction of the longitudinal axis of the annulus.

16. The fuel vaporization unit of claim 15, wherein each of the plurality of fin members is spaced apart from adjacent fin members by substantially equal intervals.

17. The fuel vaporization unit of claim 8, further comprising:
a heater unit in thermal contact with the lower portion.

18. The fuel vaporization unit of claim 8, further comprising:
a liquid fuel outlet port in the housing wall proximate the lower portion.

19. The fuel vaporization unit of claim 8, further comprising:

a liquid fuel level sensor in the lower portion.

20. The fuel vaporization unit of claim 8, wherein the evaporative liquid fuel is gasoline.

21. A method of generating vapor fuel in a fuel vaporization unit for an evaporative fuel vapor engine, the fuel vaporization unit including a housing having a wall defining a chamber, the housing chamber having a lower portion and an upper portion, comprising:

flowing a liquid fuel into the chamber through a first inlet port in the housing wall;

forming a liquid fuel bath in the lower portion of the chamber;

flowing a fuel vapor into the chamber through a second inlet port in the housing wall proximate the upper portion;

moving an agitator member in the liquid fuel bath with a motive force device;

forming vapor fuel in the upper portion of the chamber; and

flowing the vapor fuel out of the chamber through an outlet port in the housing wall proximate the upper portion.

22. The method of generating vapor fuel of claim 21, wherein the step of moving an agitator member includes:

magnetically coupling the motive force device to the agitator member; and

rotating the agitator member.

23. The method of generating vapor fuel of claim 21, wherein the steps of flowing a fuel vapor into the chamber, and flowing the vapor fuel out of the chamber includes:

forming a vacuum at the outlet port with an evaporative fuel vapor engine manifold.

24. The method of generating vapor fuel of claim 21, comprising:

heating the liquid fuel bath.